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RANGE IMPROVEMENT



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NOTES

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STATEMENT OF PURPOSE

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This publication is printed primarily to inform professional range administrators of important range improvement and management developments and findings. These "NOTES" may include extracts of published papers, unpublished preliminary reports of research work, unpublished reports on administrative studies and personal observations or suggestions of other range administrators. No claim is made as to the accuracy or completeness of studies or conclusions drawn.

All who read these RANGE IMPROVEMENT NOTES are encouraged to submit material for publication, or suggestions for improving its usefulness. Full credit will be given for any material used.

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DEVELOPMENT OF THE DIXIE-SAGER

By
Frank Jensen*

The Dixie National Forest has thousands of acres of sagebrush-covered land that needs to be reseeded. With limited funds a more economical method than plowing and drilling in rough, rocky land was desired. Consequently, several ideas were developed, and during the winter of 1967-68, Construction Foreman Marlo Davis, and St. George District General Assistant Norman Blake were assigned to construct the "Dixie-Sager."

The materials used were a worn anchor chain, two discarded railroad-rail cattle guards and two rebuilt Caterpillar D-8 track rollers. Using these materials an effective piece of rangeland revegetation equipment has been developed. A pictorial sequence of its development and use follows:



Figure 1 - The Dixie-Sager in operation on the 5000-acre Widtsoe Project, Circleville Ranger District, Dixie National Forest.

Pulling the Sager is a D-7 and a D-8 tractor. It takes tractors of 125 drawbar (Caterpillar D-7) to handle the modified chain effectively. The contract price for double chaining was \$2.37 per acre. Aerial seeding between chainings cost 50¢ per acre.

*Chief, Branch of Range Management, Dixie National Forest.

The modified chain is 270 feet long and weighs approximately 20,000 pounds. There are 235 links with railroad-rail "diggers" in addition to 15 smooth links on each end. In operation it twists to the inside resembling a giant "roto-tiller."

Construction of the Dixie-Sager

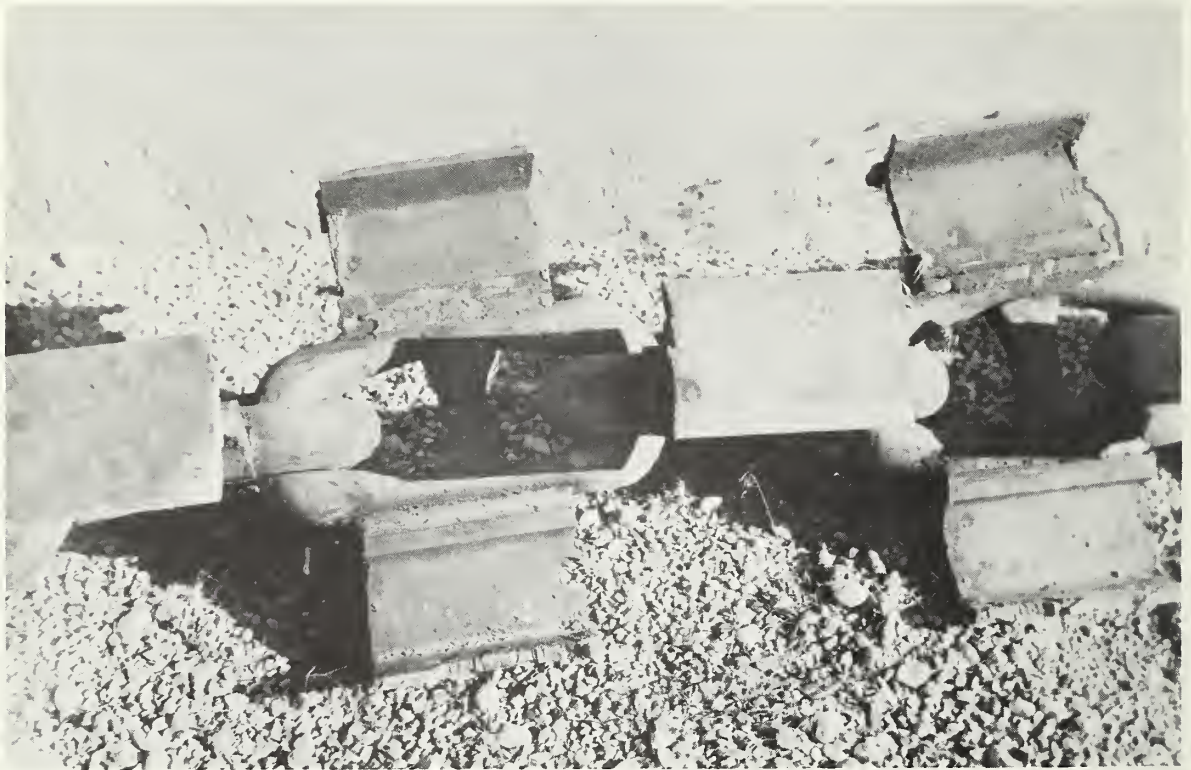


Figure 2 - Anchor chain with railroad-rail diggers.

The chain originally weighed 40 lbs. per link. After considerable use the links were worn somewhat flat. This, however, made welding the diggers on easier. The railroad rails were cut in eight-inch lengths and weigh about 20 pounds. A length of rail was welded on each side, and each link now weighs approximately 80 pounds.

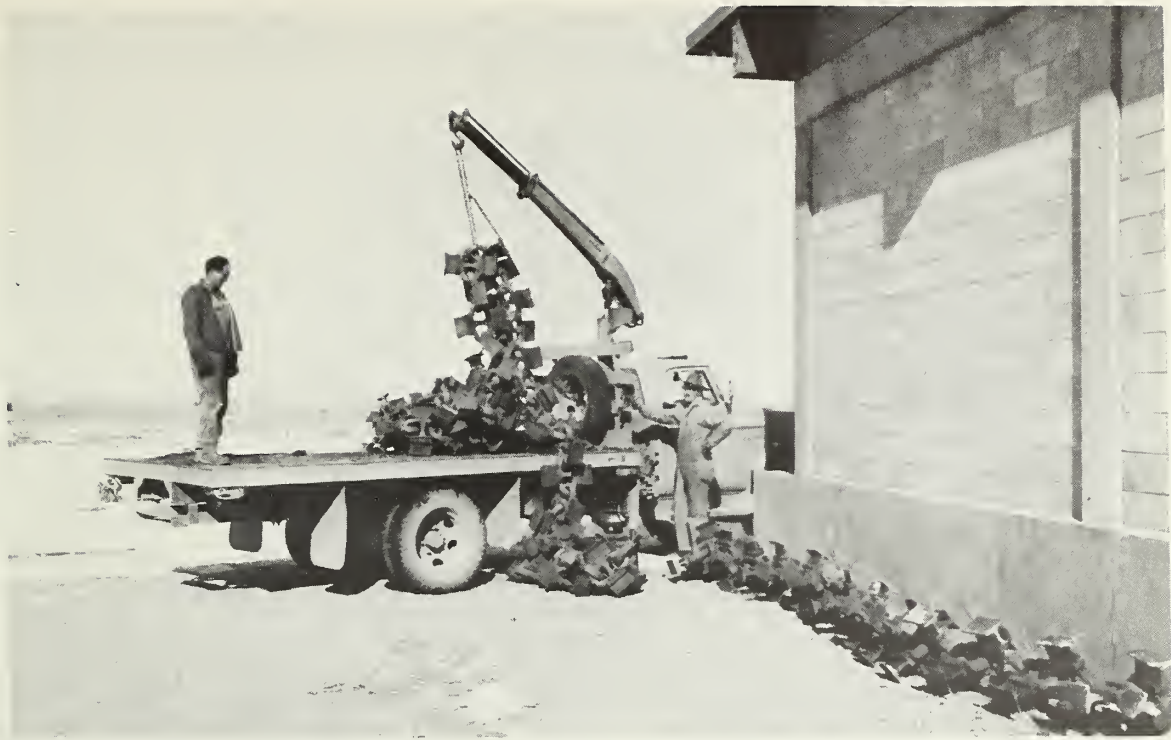


Figure 3 - The chain is divided into four sections and transported on a truck equipped with hydraulic hoist.



Figure 4 - Master links connect the sections of chain.

Swivels

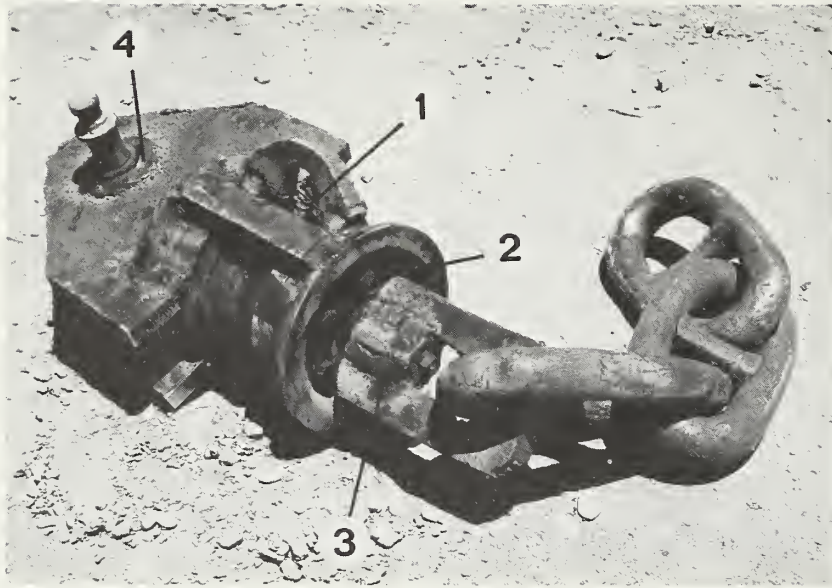


Figure 5 - Swivel for use with twisting chains.

The swivels were made from rebuilt D-8 track rollers, as suggested by Donald Cain.* They were built to fit our needs by:

1. Installing grease zerk and welding on protective guard.
2. Welding collar to drum and "spotting" all bolts so shaft cannot be pulled out.
3. Using 1-1/2-inch steel plate, end chain is welded to roller shaft.
4. "Jaws" of 1-inch plate are welded to drum, and pin from D-7 drawbar installed.

*Cain, Donald - April 1968 RANGE IMPROVEMENT NOTES.



Figure 6 - Swivel in use.

The original pair of swivels have chained 10,000 acres and show little evidence of wearing out. After each four hours of use they are lubricated with heavy duty grease.

Patterns of Operation

The Dixie-Sager pulls easiest and covers the most acres in a half-circle pattern with tractors 110-150 feet apart. On moderate terrain, approximately 40 acres per hour can be chained. However, with a swath of this width the center one-third will be less effectively worked than the outer portions.

The modified chain is "most severe" when pulled in a "U" pattern with tractors 60-80 feet apart. However, this narrow spacing cuts down considerably on the acreage covered.

An average spacing of 100 feet (drawbar pin to drawbar pin) will generally give adequate results and provide production of approximately 30 acres per hour.



Figure 7 - Tractors (80 feet apart) pulling the SAGER in a "U" pattern. The sagebrush on this area had been sprayed and was dead.

Other Developments

Originally, a swivel (see below) was put in the middle of the chain so each half could twist independently. It proved unsatisfactory and was removed because it allowed the chain to "walk" not providing adequate sage removal or scarification.

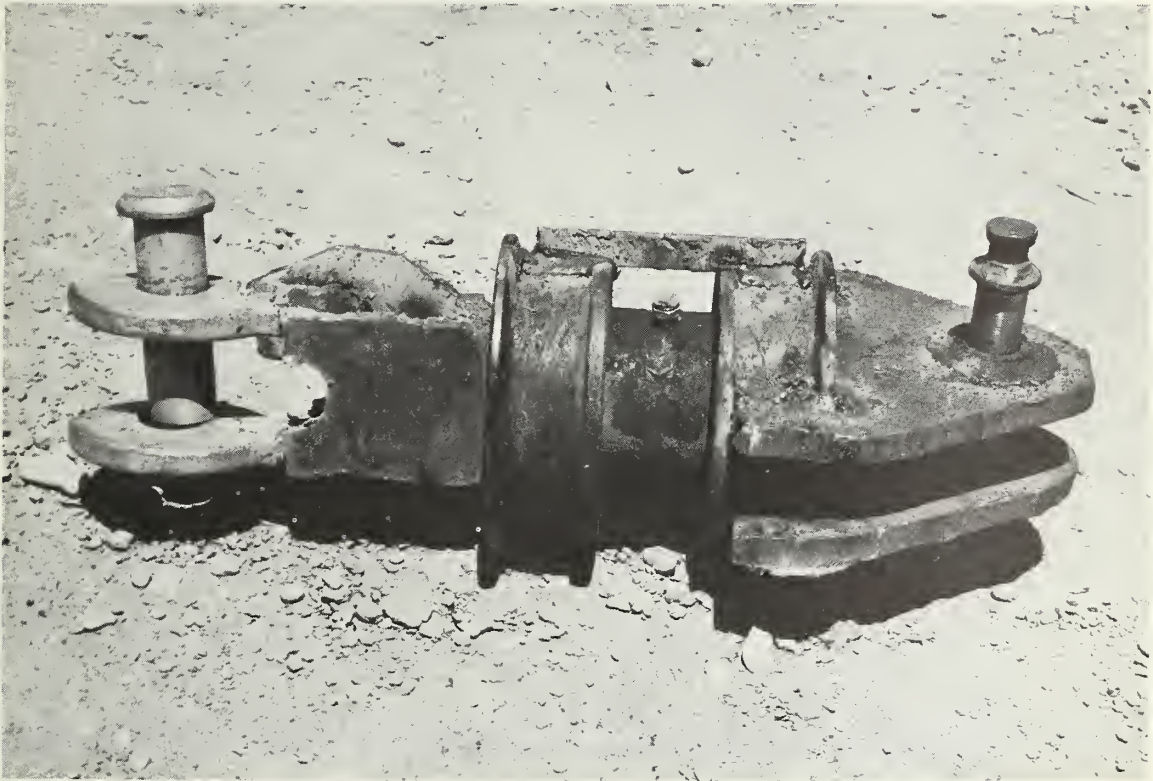


Figure 8 - Swivel for center of chain.

It was postulated that by adding a "drag" to the center of the chain it would pull in a "V" pattern and aid in sage removal. A swivel was constructed (see below) and a drag added. This worked, but caused the tractors to pull a gear lower and was cumbersome in turns. A drag may be used on occasions in the future.



Figure 9 - This swivel allows a drag to be pulled in the center of the chain without allowing each half to twist independently.

EVALUATION

The Dixie-Sager will have a permanent place in revegetation work on the Forest. It is economical to use and works well on rough, rocky land that cannot be plowed.

It is an ideal tool to use where a good seedbed is to be prepared for re-seeding and still leave native vegetation, including sagebrush, in the complex. This may be especially important on sage grouse and big game winter ranges.

It will work effectively on rangeland where seeding is not planned, yet the decadent sagebrush overstory needs to be uprooted. This condition is common on sheep ranges.

It is an excellent tool to use where sagebrush has been sprayed. The area can be aerial seeded, chained once covering the seed, and shattering the brush.

The Sager is much more effective in uprooting brush in the spring (or following heavy rain periods), when the soil is "plowable" than during dry periods when the brush won't pull.

On most areas of mature big sagebrush double chaining with a swath of approximately 100 feet will give satisfactory removal of brush and make an excellent seedbed. Costs for this operation should exceed \$2.50 per acre.

If the soil is dry or a greater degree of young sagebrush removal is desired, it may be necessary to go over the area three times or more.

The Sager does not work effectively on thick pinyon-juniper stands. The diggers hook the trees and carry them, thus accumulating more weight than the tractors can pull.

The Sager was designed for use on large scale, low-cost rangeland operations. It will not give, nor should one expect, the same degree of scarification or brush removal that can be obtained with intensive farming practices. This modified chain should not be used on highly productive stone-free sites where complete removal of competing vegetation is desired. Such areas should be plowed.

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SAFETY has NO QUITTING TIME.



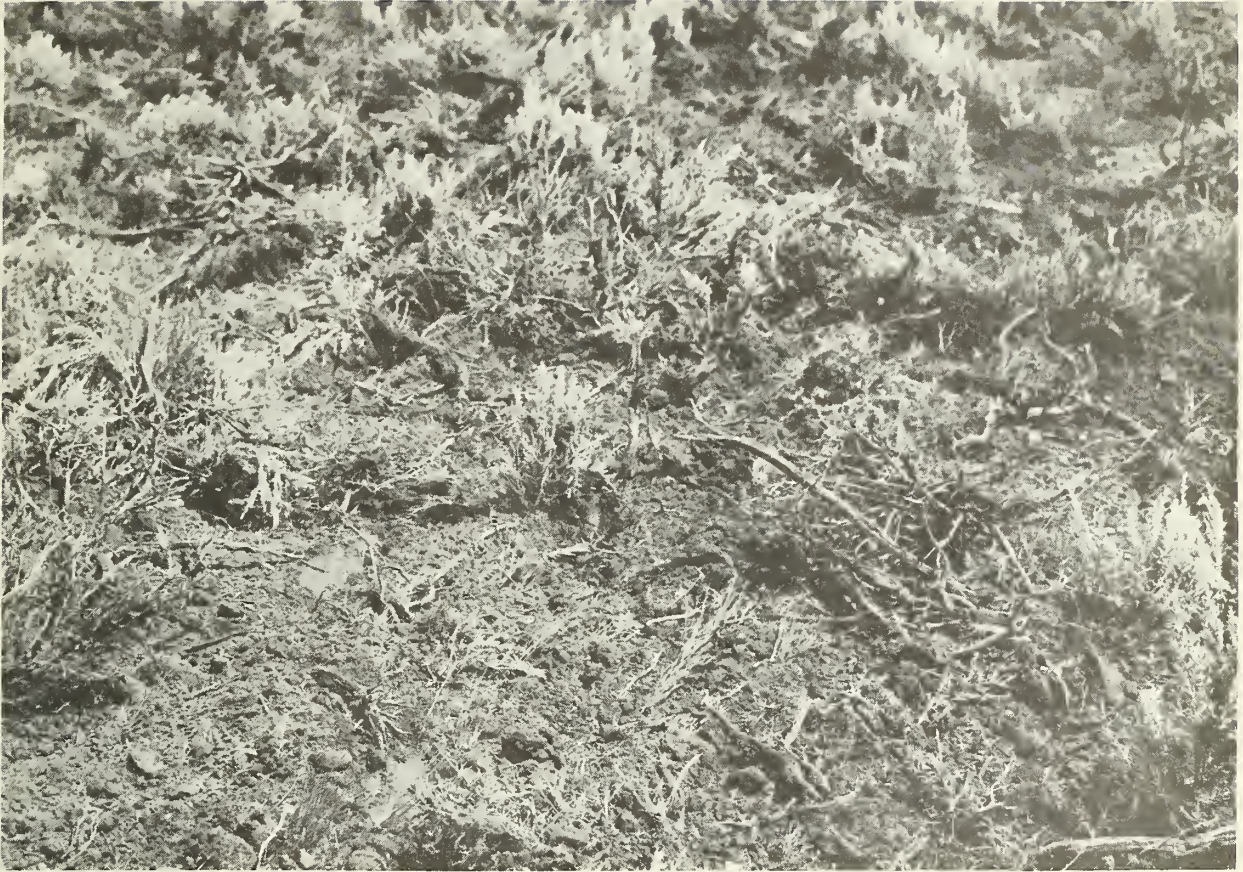


Figure 10 - Typical close-up view of big sagebrush stand gone over twice (tractors approximately 130 feet apart) with the Dixie-Sager.

The seedbed prepared is excellent. The mature brush is uprooted. Part of the young "soft stem" sagebrush remains.

TEGMAR WHEATGRASS

By

Howard Roylance*

Tegmar was developed from a grass collected in Turkey more than 30 years ago. The strain forms a dense sod. Stems are fine, erect, and about half the length of other intermediate wheatgrasses. The numerous narrow leaves are light green to blue green, mostly smooth. Tegmar equals other varieties in seedling emergence. Seedlings start seeding sooner, make denser turf, and are more tolerant to drouth.

The grass is good forage but less productive than taller varieties of intermediate and pubescent wheatgrass. Its vigor, sodding ability, late maturity and dense form of growth make it an excellent plant for control of erosion on highway rights-of-way.

Superior performance of Tegmar has been noted where it has been compared with other grass on waterways and diversions. Breeder and foundation seed will be maintained at the Plant Materials Center of the Soil Conservation Service, Aberdeen, Idaho. A small supply of foundation seed is available.

*Howard Roylance, University of Idaho Extension Agronomist.

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The world (of the 19 century) was much more beautiful to look at than it is now. Every time I go back to a place that I knew long ago, I think how sad it is. One piece of beauty after another is destroyed and that I do profoundly regret. But when it comes to ideas, there's immensely less humbug now than there was, and that I rejoice in.

--Bertrand Russell

